CE

User's Guide

OMEGAETTE®
HH306
Thermometer/Data Logger

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OMEGAnet® Online Service omega.com	Internet e-mail info@omega.com

Servicing North America:

U.S.A.:
ISO 9001 Certified
One Omega Drive, Box 4047
Stamford, CT 06907-0047
Tel: (203) 359-1660
FAX: (203) 359-7700
e-mail: info@omega.com

Canada:
976 Bergar
Laval (Quebec) H7L 5A1, Canada
Tel: (514) 856-6928
FAX: (514) 856-6886
e-mail: info@omega.ca

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info@omega.com.mx

Servicing Europe:

Czech Republic:
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Tel: +420 (0)59 6311899
FAX: +420 (0)59 6311114
Toll Free: 0800-1-66342
e-mail: info@omegashop.cz

Germany/Austria:
Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: +49 (0)7056 9398-0
FAX: +49 (0)7056 9398-29
Toll Free in Germany: 0800 639 7678
e-mail: info@omega.de

United Kingdom:
ISO 9002 Certified
One Omega Drive, River Bend Technology Centre
Northbank, Irlam, Manchester
M44 5BD United Kingdom
Tel: +44 (0)161 777 6611
FAX: +44 (0)161 777 6622
Toll Free in United Kingdom: 0800-488-488
e-mail: sales@omega.co.uk

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I. Introduction:

This instrument is a digital thermometer for use with any K-type thermocouple as temperature sensor. Temperature indication follows National Bureau of Standards and IEC584 temperature/voltage table for K-type thermocouples. Its internal memory can keep up to 16312 records.(note1.) It uses RS232 interface to perform bi-directional communication with PC.

II. Specifications:

Numerical Display: 4 digital Liquid Crystal Display

Measurement Range: -200°C ~ 1370°C -328°F ~ 2498°F

Resolution: -200°C~ 200°C 0.1°C; 200°C ~1370°C 1°C
-200°F~ 200°F 0.1°F; else 1°F

Input Protection at Thermocouple Input: 60V DC, or 24Vrms AC

Environmental:

- Operating Temperature and Humidity: 0°C ~50°C (32°F ~ 122°F) ; 0 ~ 80% RH
- Storage Temperature and Humidity: -10°C to 60°C (14°F ~ 140°F); 0 ~ 80% RH
- Altitude up to 2000 meters.

Accuracy: at (23 ± 5°C)

Range	Accuracy
-200°C ~ 200°C	±(0.2% reading + 1°C)
200°C ~ 400°C	±(0.5% reading + 1°C)
400°C~1370°C	±(0.2% reading + 1°C)
-328°F ~ -200°F	±(0.5% reading + 2°F)
-200°F ~ 200°F	±(0.2% reading + 2°F)
200°F ~ 2498°F	±(0.3% reading + 2°F)

Temperature Coefficient:

For ambient temperatures from 0°C ~ 18°C and 28°C ~ 50°C, for each °C ambient below 18°C or above 28°C add the following tolerance into the accuracy spec.

0.01% of reading + 0.03°C
(0.01% of reading + 0.06°F)

⚠ **Note:**

The basic accuracy Specification does not include the error of the probe. Please refer to the probe accuracy specification for additional details.

Sample Rate: 1.25 times per second

Dimension: 184x64x30mm

Weight: 210g Approx.

Accessory: K Type Bead Probe, Battery, Carrying Case, Instruction Menu, Soft Ware Package (Program, RS232 Connection Cable)

Power requirement: 9 Volt Battery

Battery Life: Approx. 100hrs with alkaline battery

AC Adapter: 9VDC ±15% 100mA

Plug Diameter: 3.5mmx1.35mm

Option : AC Adapter

note1:

Every time you press "REC" button to start recording data and press "REC" button again to stop recording, there will be a data set in memory, you can store as many data sets as you want until memory

is full.

III. Symbol Definition and Button Location:

▬ : This indicates that the minus temperature is sensed.

℃℉ : Centigrade and Fahrenheit indication.

K : Thermocouple Type Indication

MAX : The Maximum value is now being displayed

MIN : The Minimum value is now being displayed

: This indicates auto power off is enabled.

H : This indicates that the display data is being held.

m-d : it indicates the value below is month and day

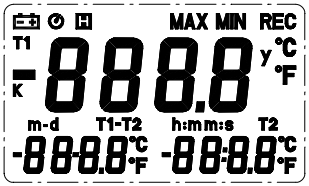
h:m : it indicates the value below is hour and minute

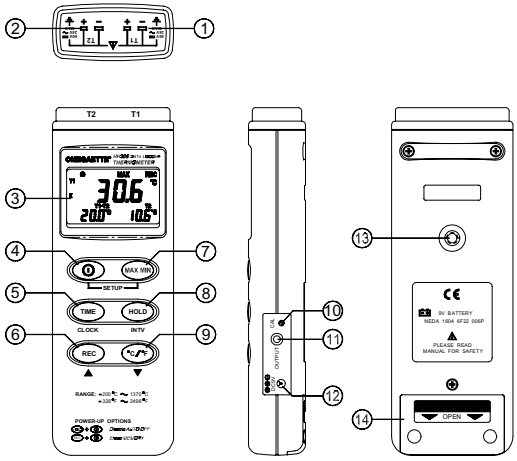
m:s : it indicates the value below is minute and second

y : it indicates year is displayed in the main window.

: The Battery is not sufficient for proper operation.

REC : This indicates that the tester is recording. If it blinks, it indicates the memory is full.

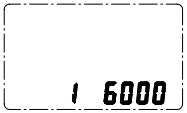




Button Location:

① K type temperature sensor T1 input connector
② K type temperature sensor T2 input
③ LCD display
④ ON/OFF button
⑤ Time display button
⑥ Record button
⑦ MAX MIN function control button
⑧ HOLD button
⑨ °C, °F control button
⑩ Offset calibration screw
⑪ Digital output connector
⑫ AC power adapter connector
⑬ Tripod connector
⑭ Battery cabinet cover

IV. Operation Instructions:



4.1 Power-Up

Press the power button to turn the thermometer ON or OFF.
When the user powers on, the LCD will show how much memory space is available to use.

For example: It indicates that there are 16,000 records memory space available.

4.2 Connection the Thermocouples

For measurement, plug the thermocouple into the input connectors.

4.3 Selecting the Temperature Scale

When the meter is first powered on, the default scale setting is set at Celsius (°C) scale. The user may change it to Fahrenheit (°F) by pressing " **°C/°F** " button and vice versa to Celsius. Next time you power on, the scale setting will be the same as which when you powerd off last time.

4.4 Data-Hold Operation

The user may hold the present reading and keep it on the display by pressing the "**HOLD**" button. When the held data is no longer needed, one may release the data-hold operation by pressing "**HOLD**" button again.

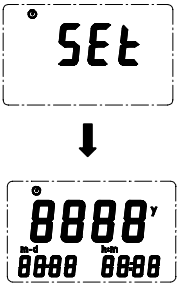
When the meter is under Data Hold operation, the **"TIME", "MAX MIN"** and " **°C/°F** " button are disabled. (when you press **"TIME**" ,**" °C/°F "** and **"max min"** button in HOLD mode, there will be two continuous beeps)

To exit the MAX/MIN mode, one may press and hold "MAX MIN" button for two seconds.

4.5 DataLogger:

When one presses the "REC" button, the meter will start recording, and pressing the "REC" button again will stop recording, If you want to clear the memory, power off the meter, then press and hold "REC" button and then press power button and hold at least 2 seconds, then release all buttons ,then LCD will show "CLR" to clear the memory.

4.6 Clock Setup :

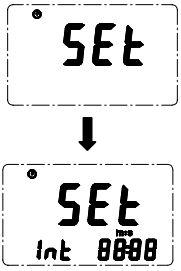


1: press and hold "MAX MIN" button and then power on the meter:

2: press "**TIME**"(clock):

3: press "REC" ▲ or **"°C/°F"** ▼ to increase or decrease number, press "**TIME**"(clock) to adjust next item. The adjusting order is year→month→day→hour→minute, then press "**TIME**" (clock) to finish adjusting. If you want abort during a setup process, press power button to cancel.

4.7 Recording Interval Setup :



1: press and hold “MAX MIN” button and then power on the meter:

2: press “HOLD"(INTV)

3: press "REC" ▲ or **"°C/°F"** ▼ to increase or decrease number, press “HOLD" (INTV) to adjust next item, then press “HOLD” (INTV) to finish. If you want abort during a setup process, press power button to cancel.

4.8 Time Operation:

When pressing the “**TIME**” button, the LCD will display time , it will show year on top of the LCD, show month and day on the left bottom of the LCD, show hour and minute on the right bottom of the LCD. Press "**TIME**" button or any other button will exit this mode. This operation will not interrupt the recording and "MAX MIN" operation.

4.9 MAX/MIN Operation:

When pressing the "MAX MIN" button the meter will enter the MAX/MIN mode. Under this mode the maximum value, minimum value is kept in the memory simultaneously and updated with every new sample of data.

When the MAX symbol is display, the Maximum is shown on the display.

Press "MAX MIN" again, then the MIN symbol is on the display and also the minimum reading.

Press "MAX MIN" again, MAX, and MIN will blink together. This means that all these data is updated in the memory and the reading is the present temperature.

One may press "MAX MIN" to circulate the display mode among these options.

When the meter is under "MAX MIN" operation and **“ °C/°F ”** button are disabled.(when you press **“ °C/°F ”** button in "MAX MIN" mode, there will be two continuous beep)

To exit the MAX/MIN mode, one may press and hold "MAX MIN" for two seconds.

4.10 Auto Power Off:

By default, when the meter is powered on, it is under auto power off mode. The meter will power itself off after 30 minutes if no key operation and no RS232 communication and no recording. combination at power on can disable auto power off.

One may press and hold “**HOLD**” button and then power on the meter and there will be two successive beeps to indicate that auto power off is disabled and the ⏲ will not show up.

4.11 Low Battery Condition

When the battery voltage is under proper operation requirement, the ▭ symbol will show on the LCD and the battery need to be replaced with new one.

4.12 Calibration Point:

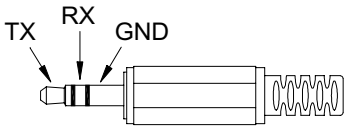
input	Adjust VR	tolerance
0 °C	VR1	± 0.1 °C
190 °C	VR2	± 0.1 °C
1000 °C	VR3	± 1 °C
1900 °F	VR4	± 1 °F

P.S

Normally, performing offset Calibration with thermal stabled ice water through VR1 will give a very good calibration result.

4.13 Digital Output:

The Digital Output is a 9600bps N 81 serial interface.
The RX is a 5V normal high input port.
The TX is a 5V normal high output port.



The command of Digital Output is list below:

RS232 command	Function	Remarks
K(ASC 4BH)	Ask for model No.	Return 4 bytes
A(ASC 41H)	Inquire all encoded data	Return encoded 10 byte
H(ASC 48H)	Hold button	
M(ASC 4DH)	MAX/MIN button	
N(ASC 4EH)	Exit MAX/MIN mode	
T(ASC 52H)	TIME button	
C(ASC 43H)	C/F button	
U(ASC 55H)	Dump all memory of thermometer	return 32768 bytes
P(ASC 50H)	Load recorded data	

- **Command K:**
  Return 4 bytes. For example, when sending command "K" to the meter, it will return "3","0","6", ASCII(13) .
- **Command U:**
  Return 32768 bytes .
- **Command P:**
  Instead of returning all 32768 bytes, it only return recorded data .
- **Command H:**
  Equivalent to one pushing on the HOLD button and no message is returned.
- **Command M:**
  Equivalent to one pushing on the MAX/MIN button and no message is returned.
- **Command N:**
  Equivalent to one pushing and hold the MAX/MIN button for two seconds to exit MAX/MIN mode.
- **Command T:**
  Equivalent to one pushing on the TIME button and no message is returned.
- **Command C:**
  Equivalent to one pushing on the °C/°F button and no message is returned.
- **Command A:**

  1st BYTE:

  The first byte is the start byte , it value is 2.

  2nd BYTE:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
C/F	Low Bat	Hold		TIME	MAX/MIN		REC

  bit 0: 1→recording mode, 0→not recording

  bit 2 bit 1

  0 0 →normal mode
  0 1 →MAXIMUN mode
  1 0 →MINIMUN mode
  1 1 →calculate MAX/MIN in background mode .

bit3: 1->Indicates the LCD is displaying time.
bit4: no use
bit5: 1→ HOLD, 0→not HOLD
bit6: 1→LOW BATTERY , 0→BATTERY NORMAL
bit7: 1→°C 0→°F

3th BYTE:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Auto Power Off	memory full	resolution	sign	OL	resolution	sign	OL

bit0: 1→T1 is OL, 0→not OL
bit1: 1→T1 value is minus, 0→T1 value is plus.
bit2: 1→4th byte and 5th byte represent #### , 0→4th byte and 5th byte represent ###.#
bit3: 1→T2 is OL, 0→not OL
bit4: 1→T2 value is minus, 0→T2 value is plus.
bit5: 1→8th byte and 9th byte represent #### , 0→8th byte and 9th byte represent ###.#
bit6: 1→Memory is full. 0→Memory is not full.
bit7: 1→Auto power off enabled. 0→Auto power off disabled.

4th BYTE: first two BCD code of T1 value.

5th BYTE:last two BCD code of T1 value

6th BYTE:
If bit3 of ***2nd BYTE*** =0 : first two BCD code of T1-T2 value.
If bit3 of ***2nd BYTE*** =1 : two BCD code of month.

7th BYTE:
If bit3 of ***2nd BYTE*** =0 : last two BCD code of T1-T2 value.
If bit3 of ***2nd BYTE*** =1 : two BCD code of day.

8th BYTE:
If bit3 of ***2nd BYTE*** =0 : first two BCD code of T2 value.
If bit3 of ***2nd BYTE*** =1 : two BCD code of hour.

9th BYTE:
If bit3 of ***2nd BYTE*** =0 : last two BCD code of T2 value.
If bit3 of ***2nd BYTE*** =1 : two BCD code of minute.

10th BYTE: end byte, it value is 3, 1nd and 10th are used to check frame error.

Appendix: Thermo couple probe specification

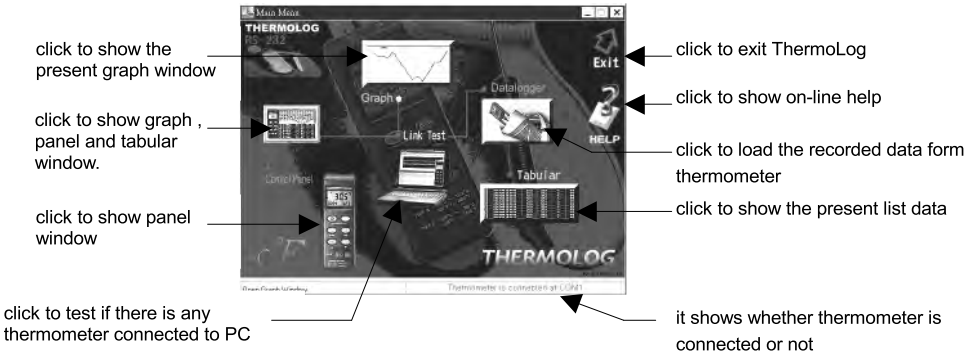
Model	Range	Tolerances	Description
5TC-TT-K-30-36(5 pack) Bead probe	-268℃ to 268℃ -450℉ to 500℉	±2.2℃ or ±0.75% (±3.6℉ or ±0.75%)	with Teflon insulation Maximum insulating temperature : 260℃

5TC-TT-K-30-36 :
probe for general condition measurements, especially for complex and hard to reach places.

V. Setup ThermoLog (Thermo DataLogger) —RS232 interface software:

- **The ThermoLog package contains:**
  1.One CD.
  2.Custom designed RS232 cable for ThermoLog.
- **System Required:**
  Windows 95 or Windows 98 or Windows NT 4.0 above.
- **Minimum Hardware Required:**
  486-100 MHz PC compatible , 16 MB RAM ;
  At least 5 MB hard disk space available to install ThermoLog program. Recommended display resolution is 800X600.
- **Install ThermoLog:**
  1.We recommend to close all other applications before installing ThermoLog software.
  2.Insert CD into disk drive.
  3.Choose the Start button on the Taskbar and select Run.
  4.Type A:\SETUP and choose OK, then it will copy ThermoLog.exe (executable file) and help file to your hard disk (default is c:\program files\ThermoLog).
  For other operation instruction, please refer to the on-line help while executing ThermoLog.

Main Menu



Link Test :

Open Link Test window to search for thermometer connected to PC. When you start the ThermoLog, this window will display first and search for thermometer. The result will be shown in the text box.

Control Panel:
By opening the Control Panel Window, the user can control thermometer via the button in this window.

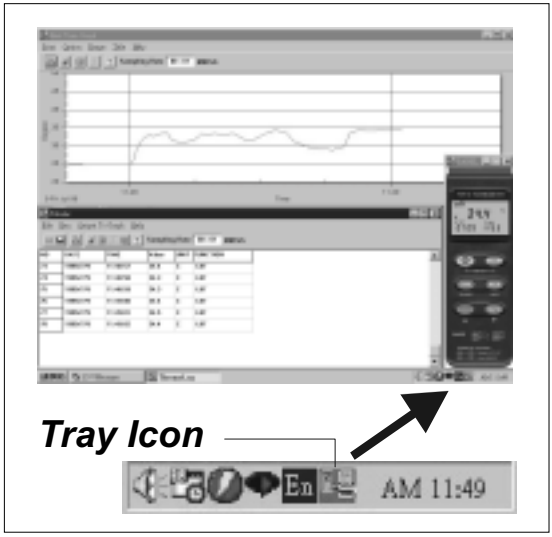
DataLogger:
By opening the DataLogger Window, the user can load the recorded data from thermometer.

Tabular:
By opening the Tabular window, the present data from the thermometer will be listed in a scrolling table. These data can be stored as a file or the table can be copy to other software such as EXCEL for further analysis.

Graph:
Open Real-Time Graph window to show the present data in graph.

Exit:
Terminates ThermoLog program.

Tray Icon:
When ThermoLog is running , there will be an icon displayed on the Windows Tray area (see figure below), you can click this icon then it will show a pop-up menu.



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3. Repair instructions and/or specific problems relative to the product.

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